

Integrated CNS Network for the Airport Surface

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Surface ICNS Network

Problem Statement:

Current surface systems:

- use VHF communications for voice only (no data) that are limited in their capabilities to enable future system automation and decision support systems;
- use an aging obsolete physical communications infrastructure that is vulnerable to outages and costly to maintain and upgrade.

Objective:

Develop and demonstrate a wireless or a combination of wireless and wired surface integrated CNS network prototype that enables:

- transfer of mission critical airport voice/data among users and service providers;
- transfer of non-critical information among aircraft, tower, airport and airline operators;
- interoperability with existing and future systems and uses open systems and commercial standards;
- required redundancy and reliability;
- scalability, flexibility and upgrades
- Seamless integration with terminal communications.

Product Description:

Prototype surface integrated CNS network

- Optimum system-level architecture for surface integrated CNS network;
- Research and development of wireless transmission and data network technologies;
- Prototype surface ICNS network demonstration in an operational airport environment involving all stakeholders in which system performance, EMI resistance and environmental compatibility is demonstrated.

Users

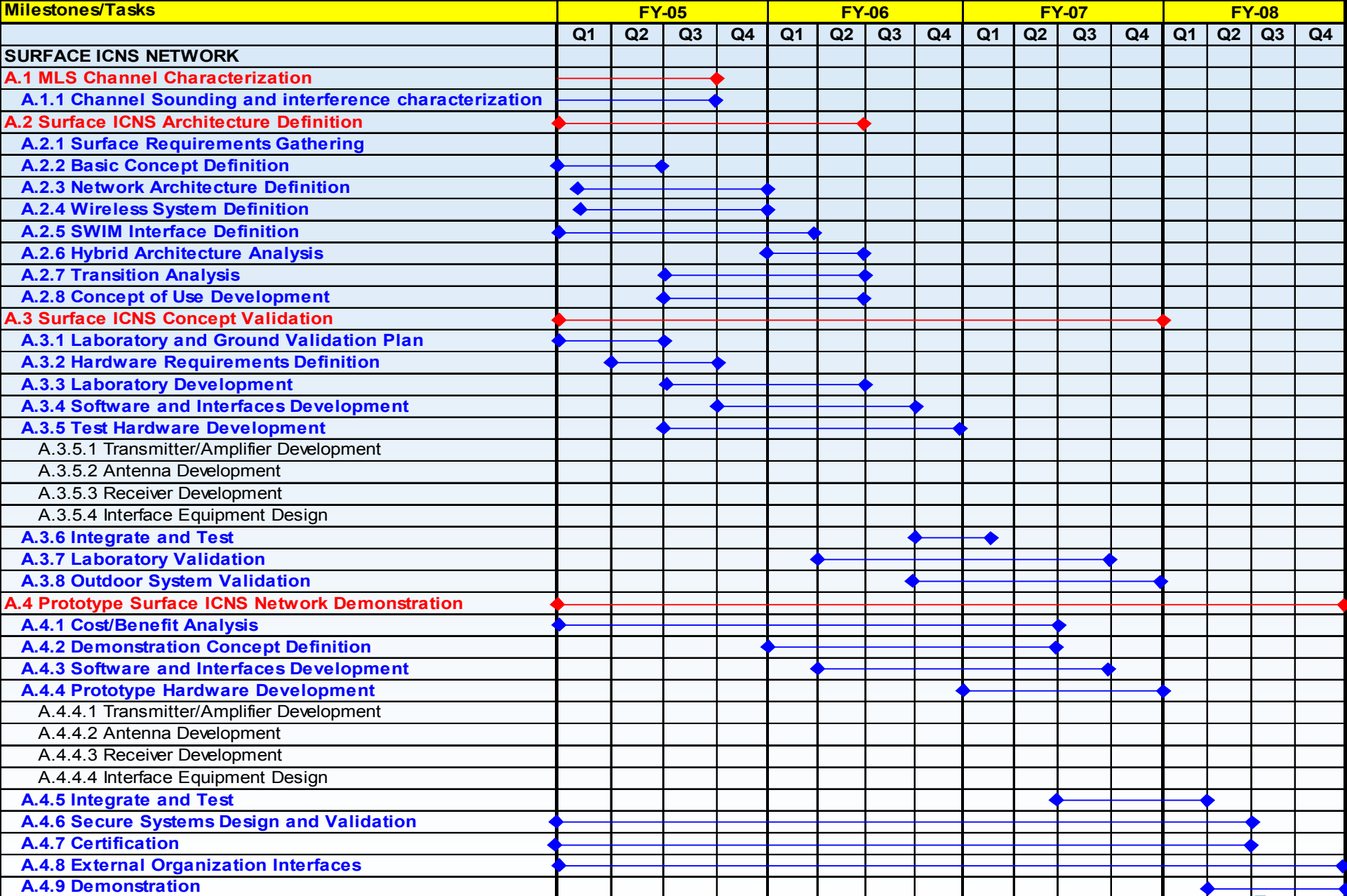
- Government
 - Federal: FAA, DHS, Customs, others
 - Local: County, City, State
 - Military Reserves
- Industry
 - Airlines
 - Cargo
 - Catering
 - Fueling
 - FBO
- General Aviation

Airport Media Used Today

- Wireless
 - VHF/UHF
 - Trunk Radio
 - Microwave
 - WLAN
- Wired
 - Fiber Optics
 - Privately Owned Copper Wire
 - Leased Telco

Wireless Considerations

- For 5 GHz ARN band: ample BW, challenging channel conditions
 - Severe multipath propagation
 - Large path loss
- (For any band) Mitigate channel degradations through
 - Good channel characterization & waveform, PHY design
 - Diversity and adaptive MA design
- Security
 - WLANs are INsecure!
 - Spread spectrum + redundancy required
- Focused adaptation of commercial technologies
 - Standardization & re-use



Presentations

- Full Global CNS & Cat IIc Landing – Robert Crow, AirNav, Inc.
- Potentials of 2G-3G technologies for Surface Communications – Mohammed Shama, Analex Corporation
- Surface CNS Performance Analysis Using ACES Uncertainty Modeling – George Couluris, Seagull Technology, Inc.

Questions

- What Communication services are candidates for transport on a surface ICNS Network?
 - Critical, non-critical, voice, data, video...
- What wireless communications technologies should be considered?
 - 802.11(?), 3G, 4G...
- How could a wireless airport surface ICNS network be implemented to meet all airport communication requirements – who owns, manages and operates?